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Mar 10, 1996

PUB-NO: JP410070091A  
DOCUMENT-IDENTIFIER: JP 10070091 A  
TITLE: MANUFACTURE OF SEMICONDUCTOR DEVICE

PUBN-DATE: March 10, 1998

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APPL-NO: JP08226381  
APPL-DATE: August 28, 1996

INT-CL (IPC): H01L 21/285; H01L 21/768

## ABSTRACT:

PROBLEM TO BE SOLVED: To solve the problem that sheet resistance just after film formation changes with time and is not stabilized in a titanium nitride film formed by using TDMAT(tetrakisdimethylamino titanium) as material.

SOLUTION: A part of a silicon oxide film 2 formed on the surface of a silicon substrate 1 is opened, and a contact hole is formed. After a titanium film 3 is formed by a sputtering method or a CVD method, a titanium nitride film 4 is formed. Without exposure to the atmosphere, i.e., the silicon substrate is not exposed to atmospheric air. At 420°C, monosilane (SiH<sub>4</sub>) only, i.e., 100% of SiH<sub>4</sub> is treated for reaction for 30-90 seconds, at a flow rate of 50sccm and a pressure of 10Torr. A tungsten plug is formed after tungsten 5 is formed. A titanium film is formed after the contact hole is formed. The titanium nitride film which is formed by using organic titanium compound excellent in step coverage to a fine contact hole is heat-treated in a silane atmosphere. Thereby a titanium nitride film whose sheet resistance is stable and low can be formed in the contact hole.

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